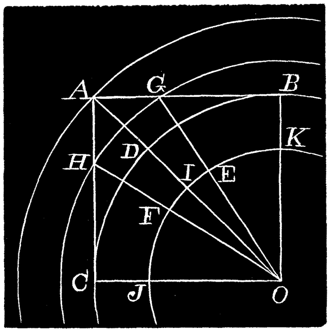
II. **Solution by F. P. MATZ, M. Sc., Ph. D., Professor of Mathematics and Astronomy in New Windsor College, New Windsor, Maryland.**

Let $OB=OC=OD=s$, $OI=x$, $OG=OH=w$; then $OA=s\surd2$, area of $\square ABOC=s^2$, and area of circle radius of which is $OA=2\pi s^2$.



First Solution.—Knowing the *favorable* chances and the *whole number* of chances, the required chance becomes

$$C=\frac{s^2}{2\pi s^2}=\frac{1}{2\pi}\ldots\ldots\ldots(A).$$

SECOND SOLUTION.

The arc JIK increases for all values of OI less than OD; and the arc HG decreases for all values of OG greater than OD. The required chance, therefore, becomes

$$C=\frac{1}{2\pi s^2}\left\{\frac{\pi}{2}\int_0^s xdx+\int_s^{s\surd2}\left[\frac{\pi}{2}-2\cos^{-1}\left(\frac{s}{w}\right)\right]wdw\right\}$$

$$=\frac{1}{8}+\frac{1}{2\pi^2}\left[\frac{\pi s^2}{4}-2\int_s^{s\surd2}\cos^{-1}\left(\frac{s}{w}\right)wdw\right]$$

$$=\frac{1}{4}-\frac{1}{2\pi s^2}\left[w^2\cos^{-1}\left(\frac{s}{w}\right)-s\surd(w^2-s^2)\right]_s^{s\surd2}$$

$$=\frac{1}{4}-\frac{1}{2\pi}\left[\frac{\pi}{2}-1\right]=\frac{1}{2\pi}\ldots\ldots\ldots(B).$$

This problem was solved with different results by *H. W. DRAUGHON*, *P. H. PHILBRICK*, and *WILLIAM B. MILWARD*. If we have space, some of these solutions will be published next month.

PROBLEMS.

6. **Proposed by Professor J. F. W. SCHEFFER, Hagerstown, Maryland.**

Find the average length of all the diameters that can be drawn in a given ellipse.

7. **Proposed by F. P. MATZ, M. Sc., Ph. D., Professor of Mathematics and Astronomy in New Windsor College, New Windsor, Maryland.**

A letter received is known to have come either from *Oshkosh* or *Ashland*. The only two consecutive letters legible on the postmark are SH. What is the probability that the letter received came from Oshkosh?

8. **Proposed by Professor G. B. M. ZERR, A. M., Principal of High School, Staunton. Virginia.**

Prove that the mean area of all triangles having their vertices upon the surface of a given triangle and bases parallel to the base of the given triangle, is $\frac{13}{210}$ (area of given triangle).

Solutions to these problems should be received on or before July 1st.